Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Editorial

Operational excellence for improving sustainable supply chain performance

1. Introduction

Planning and synchronizing operations are fundamentally essential to ensure sustainability in Supply Chains (SCs) (Bag et al., 2020). Traditionally operations management is primarily focused on efficiency, effectiveness, and economy of SCs. However, growing pressures from governments and SC stakeholders are forcing organizations to recalibrate their operations strategies to include environmental and social sustainability perspectives. There is greater impetus since proposed Sustainable Development Goals (SDGs) for 2030 by the United Nations (United Nations Development Programme, 2015). Research in operations management has also started embracing sustainability from an operational excellence perspective in SCs (Mani and Gunasekaran, 2018; Sehnem et al., 2019).

The Sustainable Supply Chain (SSC) is a concept that concurrently integrates ecological, economic, and societal measures of operations in an SC. The Triple Bottom Line (TBL) concept clubs all these three metrics of sustainability. Organizations need to evaluate not just their own operations, but also operations across the supply chains, considering all the three metrics of sustainability. A localized and short term approach to sustainability is not appropriate (Jabbour et al., 2019). The operational performance of the SCs needs to be evaluated based on their trade-offs with TBL model of sustainability.

Sustainability in operations is a significant emerging challenge for organizations (Bhandari et al., 2019; Ghadimi et al., 2019). SC operations such as quality management, lean manufacturing, six sigma, Information Technology (IT) implementation, material sourcing, inventory management, and reversed logistics operations are frequently studied in SSCs (Li, 2013; Gaustad et al., 2018; Farias et al., 2019). Most existing works on SSCs discuss strategies such as corporate social responsibility, green sourcing and supplier selection (Luthra et al., 2017), the various R's of sustainability- reduce, recycle, reuse, remanufacture, redesign (Scur and Barbosa, 2017). However, in recent years, a number of operational excellence based paradigms have been integrated in the SSC literature, such as big data (Bag et al., 2020), blockchain, Circular Economy (CE) (Gaustad et al., 2018), Inter-organizational Information Technologies, Internet of Things (Zhao et al., 2019), Industry 4.0, Theory of Constraints (Koh et al., 2017), Business Process Re-engineering (Kumar and Rahman, 2014), etc.

These research paradigms explores different dimensions of SSCs and contribute further by providing decisions support such as routing decisions, production scheduling, integration mechanisms in SSCs, risk mitigation, sustainable performance indicators, lean strategies, policy enablers, and barriers, thus, enhancing performance and excellence across SSC operations (Jabbour et al., 2019). There is a great focus given towards the impact assessment and management of SC operations, using impact assessment techniques such as Life cycle assessment, environmental management system, and carbon footprint assessment (Farias et al., 2019). There is also a growing literature that contributes towards sustainable performance measurement in SCs, especially using the TBL concept. Research in these dimensions of operations management can help managers implement sustainable operational strategies and better understand the trade-offs by applying a holistic sustainable business perspective. The theoretical contributions from these researches help managers adopt innovative approaches towards sustainability in SC operations.

Still, research in SSCs has a long way to go. The up-scaling of supply chain sustainability will require managers and practitioners to tackle complexities and potential challenges with holistic and systemic focus. Expounding the role of operational excellence activities is crucial for SC sustainability. The journey towards sustainability in SCs will require managers to tap on operational excellence approaches to influence various sustainability performance dimensions such as SSC flexibility, business competitiveness, coordination and collaboration, dynamic and relational capabilities, SC transparency, technology management and innovation (Mangla et al., 2019). However, there is a growing need to understand how operational excellence can be leveraged to improve and transform SSC structures significantly, to further enhance these SC sustainability performance dimensions. The present Virtual Special Issue (VSI) seeks to contribute in the same direction by encouraging researchers to develop an understanding of how initiatives and strategies for operational excellence will advance sustainability in SCs.

2. The virtual special issue

Enabling value chain sustainability requires a holistic and systematic focus help managers and practitioners manage the complexities and potential challenges in the SC operations. This VSI sheds light on this issue, by identifying how organizations can use excellence in supply chain operations such as IT implementations, information management, sales and marketing, logistics, etc. to mitigate the challenges of SSCs. The issue was motivated by the role such operations play in the sustainability strategy of an organization, why and how such operational excellence practices are adopted in a SSC. There is a need to study the theoretical and methodological aspects of such operations using Analytical methods including Multi-Criteria Decision Making (MCDM) models, network decisions, simulation and optimisation models, case based, and empirical studies.

Potential Topics for the VSI included, but were not limited to the following:

- Operational excellence approaches (e.g. Lean, Six-Sigma, Reverse

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Logistics, Interorganizational Information Technologies, Internet of Things, Blockchain, Industry ., Theory of Constraints, G technology) and sustainable supply chain performance and other mediator/ moderator relationships.
- TBL business frameworks and models, and their implications on emergent sustainable supply chain performance dimensions.
- Drivers/enablers/critical success factors and problems/barriers/ challenges of operational excellence approaches for sustainable supply chains and their performance improvement.
- Operational excellence approaches and knowledge management models in sustainable supply chain flexibility, collaboration, dynamism, transparency, relational capabilities and innovation performance.
- Contradictory and unexpected outcomes and relationships, as operational excellence may upset some aspects of ecological or social sustainability.
- Empirical and decision support based business models in operational excellence for upscaling the sustainable supply chain performance to manage the complexities and potential paradoxes of these relationships.
- Human expertise and stakeholder commitment in operational excellence for upscaling sustainable supply chain performance

3. Contributions of VSI

A number of excellent research articles were submitted for the VSI, however, owing to the thematic and space restrictions, 11 articles were finally accepted after a thorough review process. The research articles accepted for the VSI are summarized as follows:

Kuo et al. (2019) proposes a sustainable product-service system based on the life-cycle cost analysis and product design model. It compares the selling and leasing deign model for a product. Such an analysis is essential to balance the customer requirements with the tradeoff for sustainable performance and cost of a product.

Dev et al. (2020) uses a case-bases analysis to propose a road map for joint implementation of industry 4.0 (I4.0) and ReSOLVE model of CE. The economic and environmental performance of I4.0 is assessed in a reverse logistics set up, imparting real-time information sharing with green product diffusion in SC. The effectiveness of sustainability approaches is studied on the excellence in operations such as inventory, production planning, remanufacturing, and additive manufacturing.

Niu et al. (2020) studied the sustainable strategies for operational decisions such as pricing, ordering, and sourcing, for a Multi-National Firm (MNF) entering a developing country market. Entering into local market, MNFs could face disruptive environment that could challenge its economic and environmental sustainability. This is important to achieve a high business performance in SSCs.

Agrawal and Singh (2019) studied the role of reverse logistics in adopting and implementing CE concepts in supply chains. They explored the reverse logistics in the context of the Indian electronics industry. The effect of disposition decisions on the TBL of reverse logistics are examined using Partial Least Square technique (PLS) of Structural Equation Modelling (SEM).

Behavioral factors play a crucial role in adopting SSCM practices. Kumar et al. (2020) studied the dynamic behavior of human nature affecting implementation of SSCM practices for operational excellence. The identified factors are identified through empirical investigation and modelled using hesitant fuzzy- DEMATEL.

Bag et al. (2020) studied the role of Big Data Analytics (BDA) capabilities as an operational excellence approach to achieve sustainable supply chain performance. They used PLS-SEM to empirically show that BDA have a strong effect on the green product development innovation and supply chain sustainability.

Zhang et al. (2020) develops a guide to implement blockchain technology enabled Life Cycle Assessment (LCA). They proposed a framework integrating blockchain with Internet of Things (IoT), BDA and visualization. The blockchain technology is used to track and trace the critical information about inputs and outputs at different SC stages that can be used to assess the environmental impact of products and services in an industrial viewpoint.

Continuing in the same stream of thought, IT infrastructure is crucial for operational excellence towards supply chain sustainability. Chakraborty et al. (2020) explores the critical barriers to IT implementation in the organized as well as unorganized logistics sector in India. The difference in barriers in organized and unorganized sectors is an important managerial outcome of this study.

Yadav and Singh (2020) studied the critical success factors that help achieve a sustainable supply chain integrated with blockchain technology. Important variables related to blockchain adoption are identified from literature and modelled using PCA (principal component design) and Fuzzy-DEMATEL (Decision Making Trial and Evaluation Laboratory)

Udokporo et al. (2020) studies the impact of lean agile and green practices achieving operational excellence in supply chain from the perspective of cost, lead time and environmental waste recycling. The research explores such relationship in fast-moving consumer goods industry and identifies results to vary with adoption in different life-cycle stages.

Sehnem et al. (2019) studies the maturity level of CE adoption in emerging (Brazil) and mature (Scotland) economies. They used upper echelon theory to analyze the critical success factors of CE adoption. A case based approach is also used to identify that companies that more proactive in CE adoption batter manage challenges owing to better management of critical success factors. The management characteristics of such successful companies are also studied in their research.

4. Concluding remarks

The SI attracted research articles from varied operational perspective, such as sourcing decisions, reversed logistics, sales and logistics, big data application, blockchain application, IT implementation, Lean-agile-green management, and life-cycle assessment. Three key topics came out to be the most addressed one in the SI. The first and the most highlighted topic is the integrations of disruptive technologies, such as blockchain, big data, internet of things, and industry 4.0 in SSCs. The second topic is of CE, identifying how it can be implemented and what factors play a major role in its implementations in SSCs. The third topic is of reversed logistics, which essentially play a critical role in adoption of CE and SSC concepts.

The articles selected for the VSI very well represents the field of SSC, and importantly exemplify how excellence in SC operations can be pursued to enable sustainability in SCs. The VSI advanced the field of SSCM as well as the theme of operational excellence for SSC performance. The future research in this direction may focus on the following aspects:

- The trade-offs in SSCs from the operational performance and TBL.
- Impact of disruptive events on the operations, decisions, and operational performance of SSCs.
- Understand the interplay between disruptive technologies and CE in SSCs, the conceptual developments on this topic could be extended toward potential applications in different sectors.
- Investigate CE based business models such as sharing economy, cyber-physical-social networks, in SSCs.
- Investigate the operational excellence models in SSCs during emergency and pandemics such as COVID – 19.

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